

Rock Creek  
Huntington County  
Supplemental Evaluation

Date of Survey: September 8 to September 10, 2008

Biologist: Rod A. Edgell

Survey Objectives: Conduct population estimates for game fish at Rock Creek as described in Work Plan 300FW1F10D41635.

Methods: Fish collection effort consisted of pulsed D.C. day electrofishing with a tote barge at four stations along Rock Creek located on J.E. Roush Lake property (Figure 1). The three-pass depletion method was used with block nets at either end of the station. Stations were sampled in an upstream direction and all game fish were collected and removed until three passes had been completed. Total length of all game fish was measured to the nearest 0.1 in and weight was measured to the nearest 0.01 lbs. Five scales per half-inch group were collected for age determination and back-calculated lengths-at-age. Length frequency distribution for reporting purposes will be grouped in half-inch groups which are defined as X.0 – X.4 and X.5 – X.9. Age-length keys were also constructed to determine mean length-at-age. Proportional stock densities (PSD) were calculated for both smallmouth bass and rock bass, while relative stock densities (RSD) of 12 and 15 in fish were calculated for smallmouth bass only. All stock densities were calculated using electrofishing catch only (Anderson and Neumann 1996). Population estimates were not calculated for all game fish due to low catch rates or irregular removal patterns. Population estimates were determined using MicroFish 3.0 software (MicroFish Interactive Program, J.S. Van Deventer and W. S. Platts, Microsoft Corporation, 1986).

Summary: A total of 484 fish, weighing 168.48 lbs was collected during this survey (Table1). Smallmouth bass was the most abundant species collected by number (77%), followed

by rock bass (18%), and bluegill (2%). Other species collected include largemouth bass and channel catfish.

A total of 374 smallmouth bass was collected at Rock Creek (Table 1). Total length of smallmouth bass ranged from 2.3 to 18.6 in. The PSD, RSD-12, and RSD-15 for smallmouth bass during this survey were 43, 26, and 6, respectively (Table 2). Of the smallmouth bass collected 3% were greater than or equal to 15 in, and the electrofishing catch rate of these fish was 3.6 fish/h. Of the smallmouth bass collected in 2006 1% were greater than or equal to 15 in, and the electrofishing catch rate of these fish was 0.9 fish/h (Braun and Grier 2006). Based on the age length key and back calculated lengths at age the majority of smallmouth bass reach 12 in between ages 3 – 4 and reach 15 in between ages 5 – 6. Growth of smallmouth bass in 2008 was comparable to rates observed in 2006.

The population estimates (confidence intervals; standard error) for smallmouth bass were calculated for each station: station 1 was 49 fish (47 – 51 fish; SE = 0.866), station 2 was 118 fish (111 – 125 fish; SE = 3.445), station 3 was 97 fish (89 – 105 fish; SE = 4.254), and station 4 was 125 fish (120 – 130 fish; SE = 2.558) (Table 2). The population estimates were expanded to the number of fish per mile for each station: station 1 (440 ft) was 588 fish/mile (567 – 612 fish; SE = 10.392), station 2 (823 ft) was 757 fish/mile (713 – 801 fish; SE = 22.101), station 3 (697 ft) was 735 fish/mile (671 – 799 fish; SE = 32.225), and station 4 (685 ft) was 964 fish/mile (924 – 1003 fish; SE = 19.717). The greatest differences in population estimates from 2006 to 2008 were observed at stations 2 and 4 (Table 2). Despite these differences the overall number of smallmouth bass collected during the two surveys was nearly equal.

A total of 86 rock bass was collected at Rock Creek. Total length of rock bass ranged from 1.6 to 8.6 in. The PSD for rock bass during this survey was 22. Of the rock bass collected 14% were greater than or equal to 7 in. Based on the age length key and back calculated lengths at age the majority of rock bass reach 7 in by age 3.

The population estimates (confidence intervals; standard error) for rock bass were calculated for two stations: station 2 was 12 fish (6 – 18 fish; SE = 2.542), and station 3 was 42 fish (32 – 52 fish; SE = 4.943). The population estimates were expanded to the number of fish per mile for each station: station 2 (823 ft) was 77 fish/mile (41 – 113 fish; SE = 16.308), and station 3 (697 ft) was 318 fish/mile (243 – 394 fish; SE = 37.444). Population estimates were not calculated for rock bass in 2006.

Recommendations:

- A property rule prohibiting the harvest of black bass from Rock Creek was implemented in the fall of 2008. This survey should be duplicated in 2010 as outlined in the aforementioned work plan to assess any changes as a result of the new regulation.

Literature cited:

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.

Braun, E. R., and A. C. Grier. 2006. Smallmouth bass population estimation in Rock Creek, Huntington County Wildlife Management Area, Supplemental Evaluation. Indianapolis, Indiana.

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Date: 10/24/2008

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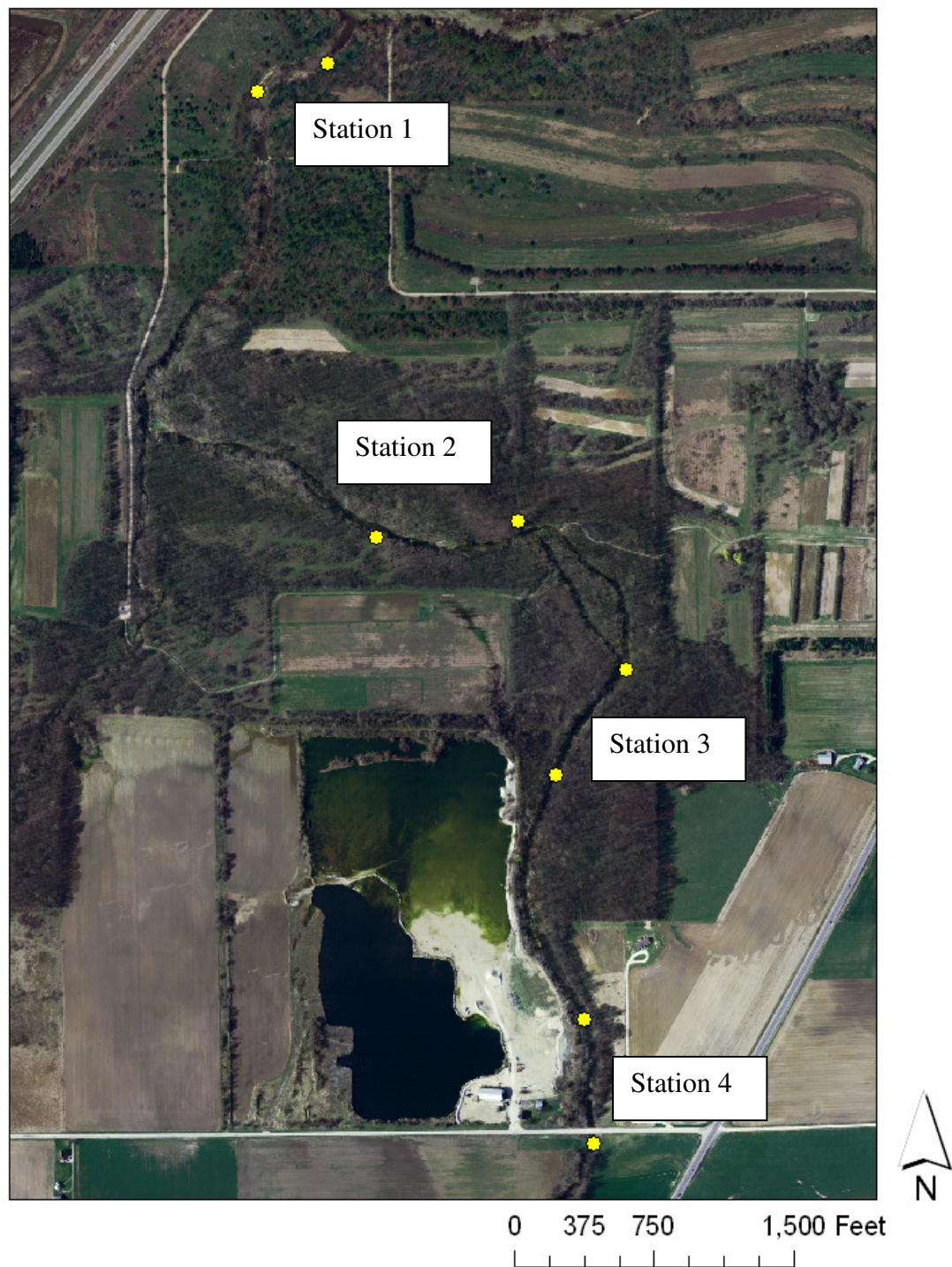


Figure 1. Electrofishing sampling locations at Rock Creek, Huntington County, Indiana in September 2008.

Table 1. Relative abundance, length range (in), and relative weight of species collected at 4 sampling stations on Rock Creek, Huntington County Indiana in September 2008.

Overall					
Species	Number	%	Length range	Weight	%
Smallmouth bass	374	77.3	2.3 - 18.6	137.94	81.9
Rock bass	86	17.8	1.6 - 8.6	7.72	4.6
Bluegill	9	1.9	4.2 - 6.2	0.75	0.4
Largemouth bass	8	1.7	3.0 - 15.4	2.99	1.8
Channel Catfish	7	1.4	9.3 - 27.9	19.08	11.3
Total	484			168.48	

Station 1					
Species	Number	%	Length range	Weight	%
Smallmouth bass	49	89.1	4.4 - 9.8	6.86	90.5
Largemouth bass	6	10.9	3.0 - 9.3	0.72	9.5
Total	55			7.58	

Station 2					
Species	Number	%	Length range	Weight	%
Smallmouth bass	113	87.6	2.4 - 16.0	39.29	97.7
Rock bass	11	8.5	1.6 - 7.0	0.66	1.6
Bluegill	4	3.1	4.3 - 4.9	0.24	0.6
Largemouth bass	1	0.8	3.8	0.02	0.0
Total	129			40.21	

Station 3					
Species	Number	%	Length range	Weight	%
Smallmouth bass	91	71.1	2.3 - 15.5	24.58	92.0
Rock bass	37	28.9	1.7 - 7.0	2.14	8.0
Total	128			26.72	

Station 4					
Species	Number	%	Length range	Weight	%
Smallmouth bass	121	70.3	2.7 - 18.6	67.21	71.5
Rock bass	38	22.1	1.8 - 8.6	4.92	5.2
Channel catfish	7	4.1	9.3 - 27.9	19.08	20.3
Bluegill	5	2.9	4.2 - 6.2	0.51	0.5
Largemouth bass	1	0.6	15.4	2.25	2.4
Total	172			93.97	

Table 2. Number, proportional stock density (PSD), relative stock density 15 (RSD-15), percent greater than or equal to 15 in ( $\% \geq 15$ ), catch per unit effort greater than or equal to 15 in ( $\text{CPUE} \geq 15$ ), estimated population, and electrofishing effort (h) of smallmouth bass collected at 4 sampling stations on Rock Creek, Huntington County in September 2006 and 2008.

2006							
	Number	PSD	RSD - 15	$\% \geq 15$	$\text{CPUE} \geq 15$	Pop Estimate	Effort
Overall	376	31	2	1	0.91	NA	3.29
Station 1	64	0	0	0	0.00	68	0.41
Station 2	164	39	5	2	2.56	166	1.17
Station 3	110	38	0	0	0.00	112	0.86
Station 4	38	25	0	0	0.00	39	0.87

2008							
	Number	PSD	RSD - 15	$\% \geq 15$	$\text{CPUE} \geq 15$	Pop Estimate	Effort
Overall	374	43	6	3	3.60	NA	3.33
Station 1	49	0	0	0	0.00	49	0.46
Station 2	113	28	2	2	2.60	118	0.77
Station 3	91	26	2	1	1.23	97	0.81
Station 4	121	57	10	7	6.98	125	1.29

## Appendix

<b>Lake:</b>	Rock Creek All Stations				<b>TN</b>	<b>GN</b>	<b>EF</b>
<b>Date:</b>	9/8/2008	to	9/10/2008	Total #	0	0	374
<b>Species:</b>	Smallmouth bass			Effort	0	0	3.33
<b>Total number:</b>	374			CPUE	NA	NA	112
<b>Total weight:</b>	137.94						
<b>Length range:</b>	2.3	to	18.6				

<b>Group</b>	<b>TL (in)</b>	<b>TN</b>	<b>GN</b>	<b>EF</b>	<b>TOTAL</b>	<b>RSD</b>
Stock	7	0	0	201	201	-
Quality	11	0	0	87	87	43
Preferred	14	0	0	19	19	9
Memorable	17	0	0	2	2	1
Trophy	20	0	0	0	0	

Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)
1.0			17.5	1	2.30	34.0		
1.5			18.0			34.5		
2.0	4	0.01	18.5	1	2.94	35.0		
2.5	23	0.01	19.0			35.5		
3.0	8	0.01	19.5			36.0		
3.5	2	0.02	20.0			36.5		
4.0	1	0.04	20.5			37.0		
4.5	7	0.05	21.0			37.5		
5.0	36	0.06	21.5			38.0		
5.5	38	0.08	22.0			38.5		
6.0	31	0.11	22.5			39.0		
6.5	23	0.13	23.0			39.5		
7.0	19	0.16	23.5			40.0		
7.5	19	0.20	24.0			40.5		
8.0	9	0.23	24.5			41.0		
8.5	9	0.28	25.0			41.5		
9.0	8	0.34	25.5			42.0		
9.5	10	0.42	26.0			42.5		
10.0	20	0.45	26.5			43.0		
10.5	20	0.56	27.0			43.5		
11.0	20	0.62	27.5			44.0		
11.5	15	0.73	28.0			44.5		
12.0	9	0.82	28.5			45.0		
12.5	10	0.91	29.0			45.5		
13.0	9	1.03	29.5			46.0		
13.5	5	1.13	30.0			46.5		
14.0	6	1.33	30.5			47.0		
14.5	1	1.38	31.0			47.5		
15.0	3	1.54	31.5			48.0		
15.5	3	1.81	32.0			48.5		
16.0	3	1.87	32.5			49.0		
16.5	1	2.22	33.0			49.5		
17.0			33.5			50.0		



Back-calculated lengths-at-age for smallmouth bass captured at Rock Creek, Huntington County, Indiana in September 2008.

Year Class	# Aged	Age							
		I	II	III	IV	V	VI	VII	VIII
2007	40	4.0							
	SD	1.0							
2006	13	3.5	6.3						
	SD	0.7	1.3						
2005	26	3.5	5.8	9.2					
	SD	0.5	1.0	1.3					
2004	10	3.1	6.5	9.5	11.8				
	SD	0.5	0.7	0.8	0.8				
2003	4	3.4	5.8	8.7	10.9	13.3			
	SD	0.2	0.3	1.0	1.2	1.1			
2002	3	3.1	5.6	9.1	11.9	13.3	14.4		
	SD	0.2	0.5	0.6	1.0	0.8	0.7		
2001	1	2.6	5.6	9.5	11.7	13.4	14.9	15.8	
	SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2000	1	3.5	5.7	9.4	13.1	15.3	16.8	17.9	18.2
	SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean*		3.4	6.0	9.1	11.5	13.3	14.4		
SD		0.5	0.8	0.9	1.0	1.0	0.7		

Age-length key for smallmouth bass captured at Rock Creek, Huntington County, Indiana in September 2008.

Length Group	# in sample	# (age) in subsample	Age							
			1	2	3	4	5	6	7	8
2.0	4	3(0)								
2.5	23	5(0)								
3.0	8	3(0)								
3.5	2	2(0)								
4.0	1	1(1)	1							
4.5	7	4(1)	7							
5.0	36	5(1)	36							
5.5	38	4(1), 1(2)	30	8						
6.0	31	5(1)	31							
6.5	23	4(1)	23							
7.0	19	5(1)	19							
7.5	19	5(1)	19							
8.0	9	3(1), 2(2)	5	4						
8.5	9	2(1), 3(2)	4	5						
9.0	8	3(2), 1(3)		6	2					
9.5	10	1(1), 1(2), 2(3)	2	3	5					
10.0	20	2(2), 3(3)		8	12					
10.5	20	1(2), 4(3)		4	16					
11.0	20	5(3)			20					
11.5	15	4(3), 1(4)			12	3				
12.0	9	3(3), 1(4)			7	2				
12.5	10	3(3), 1(4)			7	3				
13.0	9	4(4)				9				
13.5	5	1(3), 1(4), 1(5)			1	2	2			
14.0	6	2(4), 1(5)				4	2			
14.5	1									
15.0	3	1(5), 1(6)					2	1		
15.5	3	1(6)						3		
16.0	3	1(5), 1(6)					1	2		
16.5	1	1(7)							1	
17.0										
17.5	1									
18.0										
18.5	1	1(8)								1
Mean TL			6.4	8.8	11.2	13.1	14.8	15.8	16.8	18.8
SE			0.1	0.3	0.1	0.2	0.4	0.2		

<b>Lake:</b>	Rock Creek All Stations			<b>TN</b>	<b>GN</b>	<b>EF</b>
<b>Date:</b>	9/8/2008	to	9/10/2008	Total #	0	86
<b>Species:</b>	Rock bass			Effort	0	3.33
<b>Total number:</b>	86			CPUE	NA	26
<b>Total weight:</b>	7.72					
<b>Length range:</b>	1.6	to	8.6			

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	4	0	0	55	55	-
Quality	7	0	0	12	12	22
Preferred	9	0	0	0	0	
Memorable	11	0	0	0	0	
Trophy	13	0	0	0	0	

Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)
1.0			17.5			34.0		
1.5	3	0.00	18.0			34.5		
2.0			18.5			35.0		
2.5			19.0			35.5		
3.0	1	0.03	19.5			36.0		
3.5	27	0.04	20.0			36.5		
4.0	31	0.05	20.5			37.0		
4.5	7	0.06	21.0			37.5		
5.0	3	0.08	21.5			38.0		
5.5			22.0			38.5		
6.0	1	0.16	22.5			39.0		
6.5	1	0.18	23.0			39.5		
7.0	4	0.27	23.5			40.0		
7.5	3	0.32	24.0			40.5		
8.0	4	0.39	24.5			41.0		
8.5	1	0.45	25.0			41.5		
9.0			25.5			42.0		
9.5			26.0			42.5		
10.0			26.5			43.0		
10.5			27.0			43.5		
11.0			27.5			44.0		
11.5			28.0			44.5		
12.0			28.5			45.0		
12.5			29.0			45.5		
13.0			29.5			46.0		
13.5			30.0			46.5		
14.0			30.5			47.0		
14.5			31.0			47.5		
15.0			31.5			48.0		
15.5			32.0			48.5		
16.0			32.5			49.0		
16.5			33.0			49.5		
17.0			33.5			50.0		

Back-calculated lengths-at-age for rock bass  
captured at Rock Creek, Huntington County,  
Indiana in September 2008.

Year Class	# Aged	Age		
		I	II	III
2007	13	2.4		
	SD	0.2		
2006	3	2.1	4.1	
	SD	0.2	0.7	
2005	8	2.4	4.4	7.6
	SD	0.2	0.3	1.3
Mean*		2.3	4.3	7.6
SD		0.2	0.5	1.3

Age-length key for rock bass captured at Rock Creek,  
Huntington County, Indiana in September 2008.

Length Group	# in sample	# (age) in subsample	Age		
			1	2	3
1.5	3	3(0)			
2.0					
2.5					
3.0	1				
3.5	27	5(1)	27		
4.0	31	4(1)	31		
4.5	7	4(1)	7		
5.0	3	1(2)		3	
5.5					
6.0	1	1(2)		1	
6.5	1	1(2)		1	
7.0	4	2(3)			4
7.5	3	2(3)			3
8.0	4	3(3)			4
8.5	1	1(3)			1
Mean TL			4.1	5.8	7.8
SE			0.0	0.3	0.1